

4/30/98

The Examiner is respectfully requested to amend the above-identified application as follows:

IN THE CLAIMS:

Please amend Claims 1-17, 20-30, 32-49, and 52-61 to read as follows. A marked-up copy of the amended claims, showing the changes made thereto, is attached.

5.6B, >
A1

1. (Amended) A data transfer apparatus for transferring data to a device connected by a serial bus, comprising:

band width calculation means for calculating a band width based on a performance of the device;

channel ensuring means for ensuring a channel having the band width calculated by the band width calculation means; and

transfer means for transferring data with the device using the channel ensured by the channel ensuring means.

2. (Amended) The apparatus according to claim 1, wherein the device is a printer.

3. (Amended) The apparatus according to claim 2, wherein the band width calculation means calculates a band width necessary for data transfer with the printer based on a

processing speed of the printer.

4. (Amended) The apparatus according to claim 3, wherein the processing speed of the printer is based on at least one of a print speed, a print resolution, and a printer bit depth.

5. (Amended) The apparatus according to claim 3, wherein the processing speed of the printer is based on at least one of a main scanning period in printing, a number of pixels formed in the main scanning period, and a number of bits representing one pixel.

6. (Amended) The apparatus according to claim 1, further comprising:
second channel ensuring means for ensuring a second channel; and
second transfer means for performing data transfer with another device other than the device using the second channel.

7. (Amended) The apparatus according to claim 1, wherein the transfer means performs isochronous transfer.

8. (Amended) The apparatus according to claim 7, wherein, when no data transfer with the device is performed, the transfer means sends invalid data to the channel.

9. (Amended) The apparatus according to claim 1, further comprising device setting means for setting at least one of a plurality of devices as the device.

10. (Amended) The apparatus according to claim 9, wherein the device setting means sets at least two devices as the device.

11. (Amended) The apparatus according to claim 7, further comprising control means for, when a band width necessary for data transfer with another device other than the device is not more than a predetermined value, controlling to perform data transfer with the other device using the channel.

12. (Amended) The apparatus according to claim 11, wherein the predetermined value is half a band width calculated by the band width calculation means.

13. (Amended) The apparatus according to claim 7, further comprising control means for, when a number of cycles necessary for data transfer with another device other than the device is not more than a predetermined value, controlling to perform data transfer with the other device using the channel.

14. (Amended) The apparatus according to claim 1, further comprising monitoring means for monitoring a usage of the device by the channel, wherein the channel

ensuring means ensures the channel again in accordance with the usage of the device.

15. (Amended) The apparatus according to claim 9, further comprising monitoring means for monitoring a usage of the device by the channel, wherein the device setting means sets the device again in accordance with the usage of the device.

91
16. (Amended) The apparatus according to claim 9, further comprising monitoring means for monitoring usages of the plurality of devices, wherein the device setting means resets the device in accordance with the usages of the plurality of devices.

17. (Amended) The apparatus according to claim 1, wherein the channel ensuring means ensures the channel when the band width is not more than a predetermined value.

Sub B1 >
20. (Amended) A data transfer method in a system in which a device is connected by a serial bus, comprising:

92
a band width calculation step of calculating a band width based on a performance of the device;

a channel ensuring step of ensuring a channel having the band width calculated in the band width calculation step; and

a transfer step of transferring data with the device using the channel ensured in the channel ensuring step.

21. (Amended) The method according to claim 20, wherein the device is a printer.

22. (Amended) The method according to claim 21, wherein the band width calculation step comprises calculating a band width necessary for data transfer with the printer based on a processing speed of the printer.

A2 23. (Amended) The method according to claim 22, wherein the processing speed of the printer is based on at least one of a print speed, a print resolution, and a printer bit depth.

24. (Amended) The method according to claim 22, wherein the processing speed of the printer is based on at least one of a main scanning period in printing, a number of pixels formed in the main scanning period, and a number of bits representing one pixel.

25. (Amended) The method according to claim 20, further comprising:
a second channel ensuring step of ensuring a second channel; and
a second transfer step of performing data transfer with another device other than the device using the second channel.

26. (Amended) The method according to claim 20, wherein the transfer step comprises performing isochronous transfer.

27. (Amended) The method according to claim 26, wherein, when no data transfer with the device is performed, the transfer step comprises sending invalid data to the channel.

A2
28. (Amended) The method according to claim 20, further comprising a device setting step of setting at least one of a plurality of devices as the device.

29. (Amended) The method according to claim 28, wherein the device setting step comprises setting at least two devices as the device.

30. (Amended) The method according to claim 26, wherein, when a band width necessary for data transfer with another device other than the device is not more than a predetermined value, the transfer step comprises controlling to perform data transfer with the other device using the channel.

5-6 B1 >
A3
32. (Amended) The method according to claim 26, wherein, when a number of cycles necessary for data transfer with another device other than the device is not more than a predetermined value, the transfer step comprises controlling to perform data transfer with the

other device using the channel.

33. (Amended) The method according to claim 20, further comprising:
a monitoring step of monitoring a usage of the device by the channel; and
a channel re-ensuring step of ensuring the channel again in accordance with the

usage of the device.

34. (Amended) The method according to claim 28, further comprising:
a monitoring step of monitoring a usage of the device by the channel; and
a device resetting step of resetting the device in accordance with the usage of

the device.

35. (Amended) The method according to claim 28, further comprising:
a monitoring step of monitoring usages of the plurality of devices; and
a device resetting step of resetting the device in accordance with the usages of

the plurality of devices.

36. (Amended) The method according to claim 20, wherein the channel
ensuring step comprises ensuring the channel when the band width is not more than a
predetermined value.

37. (Amended) The method according to claim 20, wherein the serial bus is a bus complying with an IEEE 1394 standard.

38. (Amended) The method according to claim 20, wherein the serial bus is a bus complying with a USB standard.

39. (Amended) A data transfer system for transferring data with device connected by a serial bus, comprising:

band width calculation means for calculating a band width based on a performance of the device;

93 channel ensuring means for ensuring a channel having the band width calculated by the band width calculation means; and

transfer means for transferring data with the device using the channel ensured by the channel ensuring means.

40. (Amended) The system according to claim 39, wherein the device is a printer.

41. (Amended) The system according to claim 40, wherein the band width calculation means calculates a band width necessary for data transfer with the printer based on a processing speed of the printer.

42. (Amended) The system according to claim 41, wherein the processing speed of the printer is based on at least one of a print speed, a print resolution, and a printer bit depth.

43. (Amended) The system according to claim 41, wherein the processing speed of the printer is based on at least one of a main scanning period in printing, a number of pixels formed in the main scanning period, and a number of bits representing one pixel.

A3 44. (Amended) The system according to claim 39, further comprising:
second channel ensuring means for ensuring a second channel; and
second transfer means for performing data transfer with another device other than the device using the second channel.

45. (Amended) The system according to claim 39, wherein the transfer means performs isochronous transfer.

46. (Amended) The system according to claim 45, wherein, when no data transfer with the device is performed, the transfer means sends invalid data to the channel.

47. (Amended) The system according to claim 44, wherein the serial bus is connected to a plurality of devices,

the plurality of devices include a controller, and
each means is incorporated in the controller

48. (Amended) The system according to claim 47, further comprising device
setting means for setting at least one of the plurality of devices other than the controller as the
device.

49. (Amended) The system according to claim 48, wherein the device setting
means sets at least two devices as the device.

52. (Amended) The system according to claim 45, further comprising control
means for, when a band width necessary for data transfer with another device other than the
device is not more than a predetermined value, controlling to perform data transfer with the other
device using the channel.

53. (Amended) The system according to claim 52, wherein the predetermined
value is half a band width calculated by the band width calculation means.

54. (Amended) The system according to claim 45, further comprising control
means for, when a number of cycles necessary for data transfer with another device other than the
device is not more than a predetermined value, controlling to perform data transfer with the other

device using the channel.

55. (Amended) The system according to claim 39, further comprising monitoring means for monitoring a usage of the device by the channel, wherein the channel ensuring means ensures the channel again in accordance with the usage of the device.

56. (Amended) The system according to claim 48, further comprising monitoring means for monitoring a usage of the device by the channel, wherein the device setting means sets the device again in accordance with the usage of the device.

57. (Amended) The system according to claim 48, further comprising monitoring means for monitoring usages of the plurality of devices, wherein the device setting means resets the device in accordance with the usages of the plurality of devices.

58. (Amended) The system according to claim 39, wherein the channel ensuring means ensures the channel when the band width is not more than a predetermined value.

59. (Amended) The system according to claim 39, wherein the serial bus is a bus complying with an IEEE 1394 standard.

60. (Amended) The system according to claim 39, wherein the serial bus is a